



SUPPLY LINES WITH THE SOURCE

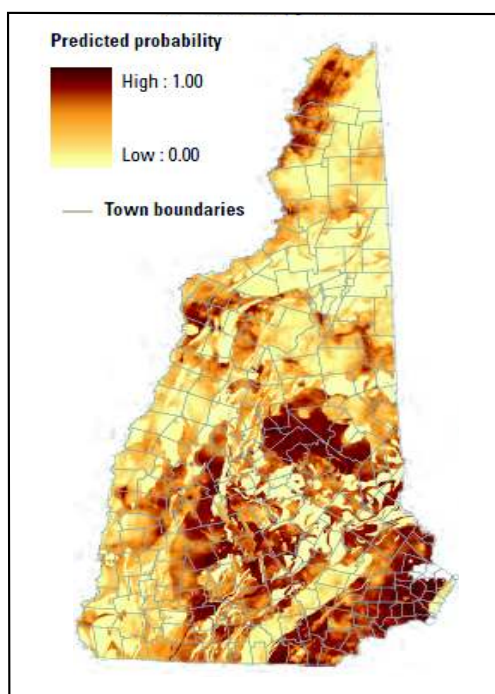


Newsletter of the NHDES Drinking Water & Groundwater Bureau
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Winter 2014

Report Examines Health Impacts of Arsenic in Drinking Water from Private Wells in New Hampshire

Hundreds of cases of cancer of the lung, bladder or skin could be avoided in New Hampshire by convincing private well users to test and treat their water to remove naturally occurring arsenic, according to a report prepared by Dartmouth College for NHDES and NH Department of Health and Human Services. The study was conducted by a team of researchers from Dartmouth's Thayer School of Engineering, Geisel School of Medicine, and Superfund Research Program. Funding for the study came from the U.S. Centers for Disease Control and Prevention.



*Estimated Occurrence of Arsenic in Bedrock Aquifers
at Concentrations ≥ 1 ug/L (USGS 2012)*

The study, which looked only at arsenic in private wells, not public water systems, was prompted in part by the publication of statewide estimates of the occurrence of arsenic in private wells by the U.S. Geological Survey in 2012.

The Dartmouth report estimates that potentially avoidable cases of cancer from arsenic in private wells in the current New Hampshire population number from 450 to 600, based on USEPA risk assessments published through 2001, but notes that a 2010 draft federal report, once finalized, would lead to an increased estimate.

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Efforts Continue to Promote Private Well Water Testing in NH

An article in the Fall 2014 issue of the Supply Lines with The Source highlighted a recent Water Testing Day in Windham, New Hampshire. This event was just one example of a laboratory working with a municipality to promote private well water testing. Efforts to promote well testing range from providing education about contaminants commonly found in New Hampshire's groundwater to making water test kits available in town halls.

Barriers that affect a well owner's decision to test their well include convenience, availability of testing information and supplies, and cost. By addressing any of these barriers, your municipality could assist residents in testing their well water and making informed decisions to reduce the risk of exposure to contaminants that may affect their health.

If your town or city is interested in partnering with a lab in order to promote private well water testing, please contact an accredited lab providing well water quality testing services. For a list of these labs, please follow this link

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/documents/labs-private-wells.pdf>

Asset Management Program Aims to Reduce Costs and Risk of Failure



Infrastructure “asset management” is a set of strategies that aims to sustain public infrastructure such as drinking water and wastewater treatment facilities. Too often, water system managers don’t think about asset management until the late stages of an asset’s life cycle, at which point the focus is on rehabilitation or replacement of something that is about to fail or has failed. Instead, assets (equipment and infrastructure components) should be placed into an Asset Management Program (AMP) early on in the life of an asset to maximize that asset’s cost-effective life cycle. A great example of a community using this proactive management approach is the North Conway Water Precinct (NCWP).



“Ozone Generator, Manchester Treatment Facility”

NCWP was established in 1905 by the New Hampshire Legislature to provide water and sewer service, fire protection, recreational facilities and programs to residents in North Conway and Bartlett. Water and sewer infrastructure owned by NCWP is relatively new due to an aggressive effort to replace aging infrastructure according to a master plan created in 1999. The 1999 master plan and subsequent updated plans identified water system deficiencies, such as aging water lines and lack of redundancy within the distribution system. Over time, NCWP has successfully completed a number of capital improvement projects to address those deficiencies.

Why does NCWP need an AMP? According to NCWP Superintendent David Bernier, “The best time to start an AMP is when the assets are new and you know everything about these assets.”

Given the expected benefits of an AMP, Bernier felt that it would

only be a matter of time before government funding would be tied to asset management requirements. Although Mr. Bernier’s primary concerns are managing the daily operation of water and wastewater infrastructure, developing a successful AMP involved ongoing communication with other departments (managing other infrastructure) within North Conway and Conway. Through closer collaboration they have been able to optimize the use of available funding for the maximum community benefit while managing all of the community’s assets.

Unlike many communities that now have to worry about aging infrastructure, with significant increases for renewal and replacement costs going forward, NCWP can concentrate on the criticality and relative risk components of their AMP. The relative risk portion of the AMP allows a community to manage assets more proactively by prospectively evaluating the risks and consequences associated with asset failure. This is far better than the reactive approach (fix it when it fails) that many communities practice in the United States. The cost saving that is associated with a proactive approach has been well documented over the years, yet the water industry has been slow to embrace this concept, leaving the infrastructure in the condition in which it currently finds itself. As Mr. Bernier says, “The future is for those who prepare for it today.”

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"We believe our estimate based on the currently available information is more likely to underestimate health effects in New Hampshire than overestimate them," noted Professor Mark Borsuk of the Thayer School, project leader for the Dartmouth study. "Over the last 25 years, the number of diseases associated with arsenic has increased, the parts of the body affected by arsenic-mediated diseases have increased, and estimates of what constitutes a safe long-term arsenic dose have decreased."

Borsuk cited a long-term study of over 2,000 people in Bangladesh which suggests that exposure to arsenic at levels comparable to what is found in untreated drinking water from New Hampshire private wells may contribute to several hundred deaths per year in New Hampshire. He was quick to note, however, that results from the Bangladesh study might not be applicable to the New Hampshire population for a number of reasons.

NHDES urges all private well users to have their water tested, consult water treatment professionals, and then install and operate appropriate treatment systems.

The report goes on to recommend "intervention" measures aimed at increasing the number of New Hampshire well users who test their water and then use appropriate treatment to remove contaminants. The Dartmouth team will recruit local officials and health organizations to pilot those measures over the coming year.

The report is available at http://des.nh.gov/organization/divisions/water/dwgb/well_testing/index.htm under "Hot Topics."

Progress in Addressing MtBE in New Hampshire's Groundwater

In 2003, the State of New Hampshire sued 22 gasoline manufacturers and refiners seeking damages for their roles in the statewide contamination of groundwater with the gasoline additive MtBE. In 2013, the state settled the lawsuit with all but one of the defendants, obtaining \$81,630,000 for statewide remediation of MtBE contamination.

Currently, NHDES has been authorized to spend up to \$22,316,661 of that money to implement a plan that will include:

- Staffing a new MtBE Remediation Bureau within NHDES's Waste Management Division.
- Investigation and remediation of existing MtBE contamination sites.
- Testing private wells that are at risk of MtBE contamination.
- Providing clean drinking water to citizens with wells impacted by MtBE.
- Installation and improvement of public water supply infrastructure in areas with significant MtBE contamination.
- Implementation of measures to prevent future MtBE contamination.

In six months, the new MtBE Remediation Bureau has:

1) hired 12 staffers to implement the plan, 2) sampled water supplies for MtBE contamination in five areas affected by gasoline releases, 3) completed a large scale cleanup at a former gas station, 4) initiated a bedrock investigation at a site with drinking water well impacts, 5) initiated three water line extension projects, 6) initiated two infrastructure feasibility studies, 7) begun a project to replace an MtBE-contaminated municipal water supply well, and 8) completed multiple release-prevention projects (typically investigation, remediation and removal of aging, substandard underground storage tanks).

The MtBE Remediation Bureau's private well sampling program is using geographic information system (GIS) technology to identify potentially at-risk domestic water supply wells in the vicinity of MtBE contamination sites. As of December 2014, 771 property owners had been contacted and over 294 of the water supplies had been sampled for MtBE contamination. There have been 63 MtBE detections and two private wells above the Ambient Groundwater Quality Standard. Newly hired staff in the Bureau will double the rate of water supply well sampling and ensure that at-risk drinking water wells are sampled as soon as they are identified.

For more information, please contact MtBE Remediation Bureau Administrator Gary Lynn, P.E. at (603) 271-8873 or Gary.Lynn@des.nh.gov.

Water Treatment Operators Praised for Upgrading Processes

Tim Green and Zeke Lapierre, operators at the Rochester Water Treatment plant, were recently awarded the 2013-2014 New England Water Works Association Operator Meritorious Service Award, which recognizes special performance by operators of drinking water utilities. The award was presented September 22, 2014 at the NEWWA Annual conference in Rockport, Maine.

Over the past 18 months Tim and Zeke have implemented numerous changes related to water resource management including modified reservoir management strategies to lower total organic carbon concentrations; cleaned and sanitized the deep bed carbon filter; carried out more aggressive flushing procedures which contributed to lower total trihalomethanes in the distribution system and improved stored water quality; and upgraded the bicarbonate silo feed system for improved pH and alkalinity control of the finished water.

Director of Public Works, Peter C. Nourse P.E., praised both Tim and Zeke, saying "The enthusiasm and dedication of these two young operators is extremely refreshing." City Manager Daniel W. Fitzpatrick noted, "This recognition is a sign that the city's renewed commitment to drinking water improvements has been bringing results."

Congratulations Tim and Zeke!

Article Credit: A longer version of this article was originally published in the October 9th Foster's Daily Democrat.



Staff Updates in DWGB

Several new staff members have recently joined DWGB and are hard at work in various capacities.

Kathryn Sanders is now an Executive Secretary for DWGB as well as the NHDES Legal Unit. Kathryn previously worked at the New Hampshire Department of Health and Human Services and has a background in accounting.

Amy Rousseau joined DWGB as an Environmentalist III and will be conducting training and outreach to seasonal systems related to the Revised Total Coliform Rule (RTRC). Amy formerly worked for Pine Environmental Services and Nobis Engineering.

Tyler Croteau is now a Program Specialist II working within the New Hampshire Environmental Laboratory Accreditation Program within DWGB. Before coming to NHDES, Tyler worked for the City of Philadelphia Water Department for just over four years as an analytical chemist.

Katie Murphy is now working fulltime for DWGB as an Environmentalist II after interning with the Bureau this past summer. Katie handles requests for GIS data and field collection of geographic data and provides technical assistance to Bureau programs. She recently graduated from the University of New Hampshire and worked previously at Normandeau Associates, Inc.

Welcome Kathryn, Amy, Tyler and Katie!!

Check Out the Emergency Power Facility Assessment Tool (EPFAT)

The US Army Corps of Engineers (USACE) is often called upon by FEMA to assist in providing temporary emergency power for critical infrastructure including water utilities. USACE has created a secure database into which utilities can enter their generator information/specs in the event that FEMA, USACE or the State mutual aid program would need to provide a generator during a disaster or other water related crisis. The database can be accessed by water and wastewater utilities, FEMA, USACE, or other emergency responders to "...input, store, update and/or view temporary power assessment data." Having pre-installation assessment data in advance helps USACE provide temporary power faster, getting you the right generator at the right time. Information, including a tutorial video is available at <https://epfat.swf.usace.army.mil/Welcome.aspx>

Rock Blasting and Source Water Protection

The use of explosives to blast bedrock at mines, quarries, or construction sites has contaminated groundwater in multiple locations in New Hampshire. In some instances, private drinking water supply wells have been contaminated with chemicals in excess of safe drinking water standards. Unless state or local officials incorporate water-quality monitoring and source water protection provisions into permits and approvals for rock blasting near drinking water supply wells, the individuals relying on these wells could be exposed to unsafe levels of contaminants in their drinking water. Exposure to some of the contaminants associated with these explosives poses an immediate health risk to sensitive populations.

Commercial explosives generally consist of a nitrate based oxidizer with a fuel and are generally in the form of a fuel oil and ammonium nitrate; they may also be found in other forms such as gels, slurries and emulsions.

The explosives are loaded into a grid of blast holes drilled into the rock and then detonated. The release of contaminants at rock blasting sites can occur as

a result of spillage, leaching of the explosive loaded into blast holes (especially when wet conditions are encountered) or the release of undetonated explosive in the broken rock after the blast. Based on NHDES's experience, the primary contaminants released to groundwater at blasting sites are nitrate and nitrite. To a lesser extent, perchlorate and volatile and semi-volatile compounds have also been released to groundwater. Blasting rock has also caused a temporary increase in turbidity in groundwater pumped from wells.

NHDES has developed detailed guidance for communities to update their local site plan review excavation and blasting regulations to proactively prevent groundwater contamination and to sample water from drinking water wells before and after rock blasting activities occur. (See Rock Blasting and



Water Quality Measures That Can Be Taken To Protect Water Quality and Mitigate Impacts (2010) online at <http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-10-12.pdf>) Implementing the measures recommended by NHDES will protect water quality and limit the potential for the consumption of contaminated drinking water around blasting sites.

The recommended measures are especially important because they ensure pre-blasting water quality data is established. Without this information, responsible parties have blamed other activities as the cause of groundwater contamination that originated from rock-blasting explosives. Documentation of pre-blasting water quality data and ongoing water quality monitoring are not typical components of pre-blast structural surveys and ongoing monitoring by blasting companies unless they are required by state or local officials. Lastly, thinking ahead about water quality impacts requires the owner of a property being developed, the general contractor responsible for site construction and the blasting contractor to jointly understand their responsibilities and potential liabilities when blasting rock near drinking water

EPA Publishes New Flood Resilience Guide for Water and Wastewater Utilities

EPA's Water Security Division has released one of their newest tools called Flood Resilience: A Basic Guide for Water and Wastewater Utilities. Drinking water and wastewater utilities are particularly vulnerable to flooding, which can damage pumps, disconnect chemical tanks, break distribution lines and disrupt power supplies. Targeted to small and medium utilities, the Flood Resilience Guide outlines a simple, four-step assessment process to help any water utility understand their flooding threat and identify practical mitigation options to protect their critical assets. With a user-friendly layout, the Guide provides worksheets, instructional videos and flood maps to help utilities through the process. You can download the tool from EPA's website at <http://water.epa.gov/infrastructure/watersecurity/emmerplan/>

New Publication Makes a Case for Investing in Natural Infrastructure

Submitted by Todd Gartner, Senior Associate, World Resource Institute's Natural Infrastructure for Water Program

Aging infrastructure, increasing demand and more frequent extreme weather events like wildfires and flooding are driving up the cost of water management. It's a complex problem, but one of the potential solutions is decidedly low-tech: invest in nature.

The World Resources Institute's (WRI) publication, *Natural Infrastructure: Investing in Forested Landscapes for Source Water Protection in the United States*, brings together insights of more than 50 authors to integrate "natural infrastructure" into water management. Incorporating strategically located forests, wetlands and floodplains to complement existing "built" infrastructure can reduce water-management costs and effectively secure clean drinking water.



Case Studies in Natural Infrastructure Investment

The new guide includes case studies that detail investments being made to protect natural infrastructure. Several water districts are already working to integrate natural infrastructure into traditional water management strategies--with the potential to reap significant benefits:

- In Maine, the board of the Portland Water District recently voted unanimously to dramatically scale up investments in conservation easements to maintain high water quality in its rapidly developing watershed.

- The city of Raleigh, North Carolina has allocated \$7.5 million since 2005 for strategic land conservation to help address declining water quality in its primary reservoir.
- The water utility in Eugene, Oregon is investigating options to establish vegetated buffers that can shield streams and other upstream water sources from run-off and other land development impacts.

Despite the increase in cities investing in nature for water, the strategy is still considerably underutilized. While there are various reasons for this issue, it often comes down to a lack of know-how on identifying opportunities, designing programs that use natural infrastructure, and implementing projects.

A Toolkit to Support Investments

Co-edited with Earth Economics and Manomet Center for Conservation Sciences, the *Natural Infrastructure* publication provides the insights, analysis and case studies necessary to help all levels of water decision makers understand and implement natural infrastructure strategies. The guide describes the current "state of practice" of natural infrastructure investment showing that there is ample opportunity for securing natural infrastructure for

water and an expanding toolkit for doing so. Several findings from the guide's comprehensive review of the economic and scientific literature highlight the following.

- 1) The financial case for natural infrastructure can be made and the economic benefits can be substantial. Tools and methods exist for identifying cost-saving opportunities and comparing the costs of benefits of natural versus built infrastructure.
- 2) The scientific foundation is robust. The latest

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science establishes connections between natural infrastructure investments and water resource outcomes. Risks and uncertainty can be managed.

3) Local decision maker participation is critical. Seek out key partners, build durable stakeholder commitment and articulate a vision of success.

4) Investment in natural infrastructure must be large-scale and sustained to be meaningful. A long list of finance mechanisms is available to get dollars on the ground.

Investing in forested landscapes is not only good for the balance sheets of utilities, municipalities and businesses—it's a solution that will provide tremendous benefits to communities across the United States. Download the Natural Infrastructure

report at <http://www.wri.org/publication/natural-infrastructure> to learn more about the economics, science, partnerships, and finance mechanisms underlying successful efforts to secure the water-related functions of forests and other ecosystems.

Building on the Natural Infrastructure publication, WRI is now conducting in-depth comparative analysis of fourteen different municipalities and water utilities that have made investments in natural infrastructure. This new report will provide a "roadmap" that local stakeholders can use to assess opportunities and develop strategies for natural infrastructure investments. Look for this publication in June 2015.

Please contact Todd Gartner tgartner@wri.org or Nat Lichten at nlichten@wri.org to learn more about WRI's Natural Infrastructure for Water Program.

Viewpoints expressed in contributed articles are those of the author and not necessarily those of NHDES. Furthermore, NHDES has not necessarily verified the accuracy of all statements in the article.

Small Public Water System Operator: Grade 1A Training



In March of 2015, a Small Public Water System Operator Grade 1A Training course will be offered by NHDES. This educational course is for owners, operators and other persons involved or interested in becoming involved with the management and operation of small public drinking water systems. The course is designed to provide fundamentals on the theory and practical knowledge required to maintain and operate a small public water system. The course is specifically geared toward individuals interested in becoming certified water works operators in the State of New Hampshire. No prior experience is required to attend the class.

For questions or details contact Wade Pelham, NHDES at (603) 271-2410 or wade.pelham@des.nh.gov.



Mark Your Calendars – 2015 Drinking Water Source Protection Conference

May 6, 2015 at the Grappone Conference Center
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